Cleveland Green Building Standard Handbook

Cleveland Department of Community Development
Published February 7, 2009; Revised October 5, 2009: Revised January 28, 2010

City of Cleveland

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1. Introduction

On November 14, 2007, Mayor Frank G. Jackson announced the creation of the Cleveland Green Building Standard. In his remarks he said, "The City of Cleveland is working to make Cleveland a City of Choice. In doing so, Cleveland seeks to provide affordable housing that reduces the costs to home buyers & renters for heating & cooling, reduces the environmental impact of our communities, and provides universal access to the elderly and disabled. Cleveland will develop green building policies that help create houses that:

- Are affordable to operate and maintain
- Are energy efficient
- Healthy
- Accessible and transit oriented
- Reduce impact on the environment by managing stormwater run-off and provide green space for healthy communities"

The Mayor also announced a timetable for implementation of the Green Building Standard. Beginning in 2008, developers could qualify for additional resources for residential projects meeting the standard; in 2009, all residential projects receiving direct assistance from the City of Cleveland would be required to meet the Cleveland Green Standard; and in 2010 all residential projects seeking Cleveland's CRA tax abatement would be required to meet the standard.

This handbook is a reference guide for developers, builders and homeowners who wish to implement the Cleveland Green Building Standard. The Green Building Standard. Is designed to help homeowners contain energy costs, reduce their contribution to climate change and to reduce the demand for scarce natural resources. The Standard also creates direct benefits for developers, including cost savings from efficient operation, a marketing advantage and public recognition of the high performance nature of their homes.

2. Green Housing Advisory Committee

The City of Cleveland is grateful to the members of the Green Housing Committee who volunteered their time to review the operational issues presented by the new policies on Green residential development. The committee members are:

Chuck Ackerman, Cleveland Housing Network
Robert Jackimowicz, Cleveland City Council Staff
Mandy Metcalf, Environmental Health Watch
David Payne, Payne and Payne Builders
The Honorable Sabra Pierce Scott, Cleveland City Council, Ward 8
Keith Sutton, Sutton Builders
Norman Tidmore, Cleveland Department of Community Development
Andrew Watterson, Cleveland Sustainability Office
Bill Whitney, Enterprise Community Partners
John Wilbur, Cleveland Department of Community Development

3. Cleveland Green Housing Policy

Beginning January 1, 2009, all projects seeking public funding and incentives shall meet the requirements set forth in the "Cleveland Green Standard." The standard established is based on the nationally recognized green building criteria and standards of Enterprise Green Communities Initiative. Projects receiving assistance will need to meet all the mandatory requirements of the Enterprise Green Communities standards plus provide evidence their project achieves 30 discretionary points. Enterprise Green Communities requires a Phase I Environmental Assessment. The rehabilitation of 1-4 unit residential structures is exempt from the Phase I requirement.

Beginning January 1, 2010, to qualify for residential tax abatement under Cleveland's Community Reinvestment Area (CRA) tax abatement program all new construction and rehabilitation projects will need to meet or exceed the Cleveland Green Standard.

Homeowners are strongly encouraged to apply the Cleveland Green Standard to their entire home when undertaking major improvements, but tax abatement will be available if:

- the project is limited to untreated spaces (commonly garages, outbuildings or outdoor improvements); or
- is a home addition.

4. Enterprise Green Communities

The Green Communities Initiative was developed by Enterprise Community Partners in cooperation with other national housing and environmental organizations including USGBC. This program is specifically designed to promote green building for affordable housing and is the first in the country to address the need to improve the housing stock of low and moderate income communities.

A full explanation of Enterprise Green Communities can be found in **Appendix 1** and at http://www.practitionerresources.org/cache/documents/666/66641.pdf

5. Alternative Green Evaluation Systems

Builders and Developers may have made business decisions or based their building approaches based on other Green rating systems. To provide operational flexibility, Cleveland will recognize two other Green Rating systems as substantially equivalent to the Enterprise Green Communities standard.

Leadership in Energy and Environment - (LEED) Silver

LEED was created by the U.S. Green Building Council as an industry based green building standard. LEED is divided into five categories that address various components of a green building. A LEED Silver project must be certified as earning 33-38 of the 69 points available under the LEED program.

Developers using LEED for their developments will need to meet the Silver standard. As of this writing, LEED certification is available for high-rise new construction, multi-family renovation and single family new construction.

A full explanation of the LEED program and the standards for Silver certification can be found at http://www.usgbc.org/DisplayPage.aspx?CMSPageID=222.

A LEED for Homes single family new construction project will qualify under the Cleveland Green Standards program. More information on LEED for Homes can be found at http://www.usgbc.org/DisplayPage.aspx?CMSPageID=147

LEED is developing a REGREEN program for home restoration projects. "Restoration" encompasses rehab and renovation, but does not include simple home repairs. The REGREEN program has not yet developed a rating system. If you are committed to a LEED REGREEN project please contact the Cleveland Department of Community Development at (216) 664-4000 to discuss the way your project may qualify for assistance.

National Association of Home Builders National Model Green Home Building Guidelines.

Developers of newly constructed homes may use the NAHB National Model Green Home Building Guidelines if they achieve the scores shown in the table below. These scores exceed the requirements for the NAHB "Gold" requirements.

NAHB anticipates the acceptance of a revised National Green Building Standard shortly. This expanded program will include single and multi-family renovation and will include a new "platinum" rating. Once official, changes will be made to this policy to reflect the new, more inclusive standards.

National Green Building Standard Categories	Additional Points Required
Lot Design	36
Resource Efficiency	77
Energy Efficiency	100
Water Efficiency	34
Indoor Air Quality	72
Operations	16
Global	11
Optional Points	50

6. Historic Homes and Buildings

Applicants completing restoration of a historic home or structure may us any of the recognized Green Rating systems, but are strongly encouraged to use the Enterprise Green Communities Standard which provides the flexibility to maintain key historic components with modest administrative cost.

7. Evidence of Compliance

Every project should begin with a Green Development Plan developed by the owner, design professionals and the builder/contractor. Homeowners are encouraged to have the Green Rater help with this plan. The Green Development Plan assures that all member of the project team understand the Green goals for the project. The City will request a copy of the Green Development Plan at a time determined by the program being used.

Developers and owners of all homes rehabilitated or constructed with the assistance above will need to secure third party verification of compliance with the standards. Each of the qualifying Green Rating Systems has certified raters. The cost of The table below identifies the type of raters and a resource with the current list of qualified experts.

Program	Rater	Resource List
Enterprise Green Communities	HERS Certified Raters	http://www.ehw.org/AGHC/AGHC_EnergyAuditorFlyer.pdf
LEED	LEED Certified Providers	http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1554
NAHB Model Green Home Building Guidelines	Green Building Standard Raters	Contact The Cleveland HBA for a list of local green raters

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Appendix 1: Enterprise Green Communities Checklist and References

A complete overview of the Enterprise Green Communities Program can be found at http://www.greencommunitiesonline.org/tools/criteria/

The Checklist for Enterprise Green Communities follows:

Green Communities Criteria Checklist

Revised February 2008

Developer Name:
Project Name:
Address (Street/City/State):

Yes	No	?			Maximum Points
			Integrated Design		
			1.1	**Green Development Plan** Submit Green Development Plan outlining the integrated design approach used for this development that demonstrates involvement of the entire development team.	Mandatory
Yes	No	?	**Site, Location and Neighborhood Fabric**		
			2.1a LH	**Smart Site Location: Proximity to Existing Development** Provide site map demonstrating that the development is located on a site with access to existing roads, water, sewers and other infrastructure within or contiguous (having at least 25 percent of the perimeter bordering) to existing development.	Mandatory *except infill site or rehabs*
			2.1b LH	**Smart Site Location: Protecting Environmental Resources - New Construction** Do not locate new development within 100 feet of wetlands, critical slope areas, land identified as habitat for a threatened or endangered species; or on land previously used as public park land, land identified as prime farmland, or with elevation at or below the 100-year floodplain.	Mandatory *except infill site or rehabs*
			2.1c LH	**Smart Site Location: Proximity to Services - New Construction** Locate projects within a ¼ mile of at least two, or ½ mile of at least four community and retail facilities.	Mandatory *except infill site or rehabs*
			2.2	**Compact Development: New Construction** Achieve densities for new construction of at least six units per acre for detached/semi-detached houses; 10 for town homes; 15 for apartments.	Mandatory *except rehabs*
			2.3	**Walkable Neighborhoods: Sidewalks and Pathways** Connect project to the pedestrian grid. Include sidewalks or other all-weather pathways within a multifamily property or single-family subdivision linking residential development to public spaces, open spaces and adjacent development.	Mandatory
			2.4a LH	**Smart Site Location: Passive Solar Heating/Cooling** Orient building to make the greatest use of passive solar heating and cooling.	4
			2.4b	**Smart Site Location: Grayfield, Brownfield or Adaptive Reuse Site** Locate the project on a grayfield, brownfield or adaptive reuse site.	10
			2.5 LH	**Compact Development** Increase average minimum densities to meet or exceed: seven units per acre for detached/semi-detached; 12 units for town homes; and 20 units for apartments.	5
			2.6	**Walkable Neighborhoods: Connections to Surrounding Neighborhood** Provide a site plan demonstrating at least three separate connections from the development to sidewalks or all-weather pathways in surrounding neighborhoods.	5
			2.7 LH	**Transportation Choices** Locate project within ¼ mile radius of adequate public transit service, or ½ mile radius from an adequate fixed rail or ferry station.	12
Yes	No	?	**Site Improvements**		
			3.1	**Environmental Remediation** Conduct a Phase I Environmental Site Assessment and provide a plan for abatement if necessary.	Mandatory
			3.2 LH	**Erosion and Sedimentation Control** Implement EPA's Best Management Practices for erosion and sedimentation control during construction referring to the EPA document, Storm Water Management for Construction Activities.	Mandatory
			3.3 LH	**Landscaping** Provide a tree or plant list certified by the Architect or Landscape Architect, that the selection of new trees and plants are appropriate to the site's soils and microclimate and do not include invasive species. Locate plants to provide shading in the summer and allow for heat gain in the winter.	Mandatory *if providing landscaping*

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Yes	No	?			
			3.4 LH	**Surface Water Management** Capture, retain, infiltrate and/or harvest the first ½ inch of rainfall that falls in a 24-hour period.	5
			3.5	**Storm Drain Labels** Label all storm drains or storm inlets to clearly indicate where the drain or inlet leads.	2
Yes	No	?	**Water Conservation**		
			4.1a LH	**Water-Conserving Appliances and Fixtures: New Construction** Install water-conserving fixtures with the following minimum specifications: toilets – 1.3 GPF; showerheads – 2.0 GPM; kitchen faucets – 2.0 GPM; bathroom faucets – 2.0 GPM	Mandatory
			4.1b LH	**Water-Conserving Appliances and Fixtures: Moderate Rehabilitation** Install water-conserving fixtures with the following minimum specifications *for toilets and shower heads* and follow requirements for other fixtures wherever and whenever they are replaced: toilets – 1.3 GPF; showerheads – 2.0 GPF; kitchen faucets – 2.0 GPM; bathroom faucets – 2.0 GPM.	Mandatory
			4.1c LH	**Water-Conserving Appliances and Fixtures** Install water-conserving fixtures with the following minimum specifications: toilets – 1.1 GPF; showerheads – 1.75 GPM; kitchen faucets – 2.0 GPM; bathroom faucets – 1.5 GPM	5
			4.2 LH	**Efficient Irrigation** If irrigation is necessary, use recycled gray water, roof water, collected site run-off, water from a municipal recycled water system, or a highly efficient irrigation system including all the following: system designed by EPA Water Sense professional; plant beds with a drip irrigation system; separately zoned turf and bedding types; a watering zone timer/controller; moisture sensor controller.	Mandatory *if irrigation is necessary*
Yes	No	?	**Energy Efficiency**		
			5.1a LH	**Efficient Energy Use: New Construction** Meet Energy Star standards (single family and low rise residential); exceed ASHRAE 90.1-2004 by 15 percent; California-exceed Title 24 by 15 percent; Oregon, Washington, Idaho and Montana--meet Northwest Energy Star	Mandatory
			5.1b	**Efficient Energy Use: Moderate & Substantial Rehabilitation** Perform an energy analysis of existing building condition, estimate costs of improvements, implement measures that will improve building energy performance by 15 percent from pre-renovation figures.	Mandatory
			5.2 LH	**Energy Star Appliances** If providing appliances, install Energy Star clothes washers, dishwashers and refrigerators.	Mandatory *if providing appliances*
			5.3a LH	**Efficient Lighting: Interior** Install the Energy Star Advanced Lighting Package in all interior units and use Energy Star or high-efficiency commercial grade fixtures in all common areas and outdoors.	Mandatory
			5.3b LH	**Efficient Lighting: Exterior** Install daylight sensors or timers on all outdoor lighting, including front and rear porch lights in single family homes.	Mandatory
			5.4	**Electricity Meter** Install individual or sub-metered electric meters.	Mandatory *(see full criteria for exceptions)*
			5.5 LH	**Additional Reductions in Energy Use** Exceed the relevant Energy Star HERS score for low-rise residential buildings or exceed other standards by increased percentages.	Optional *(see full criteria)*
			5.6a LH	**Renewable Energy** Install PV panels, wind turbines or other renewable energy source to provide at least 10 percent of the project's estimated electricity demand.	15
			5.6b	**Photovoltaic (PV) Ready** Site, design, engineer and wire the development to accommodate installation of PV in the future.	2
Yes	No	?	**Materials Beneficial to the Environment**		
			6.1 LH	**Construction Waste Management** Develop and implement a construction waste management plan to reduce the amount of material sent to the landfill by at least 25 percent.	5
			6.2 LH	**Recycled Content Material** Use materials with recycled content; provide calculation for recycled content percentage based on cost or value of recycled content in relation to total materials for project. Minimum recycled material must be 5 percent	14

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			6.3 LH	**Certified, Salvaged and Engineered Wood** Commit to using at least 25 percent (by cost) wood products and materials that are salvaged wood, engineered framing materials or certified in accordance with the Forest Stewardship Council.	5
			6.4a LH	**Water-Permeable Walkways** Use water-permeable materials in 50 percent or more of walkways.	5
			6.4b LH	**Water-Permeable Parking Areas** Use water-permeable materials in 50 percent or more of paved parking areas.	5
			6.5a LH	**Reduce Heat-Island Effect: Roofing** Use Energy Star-compliant and high-emissive roofing or install a "green" (vegetated) roof for at least 50 percent of the roof area; or a combination of high-albedo and vegetated roof covering 75 percent of the roof area.	5
			6.5b LH	**Reduce Heat-Island Effect: Paving** Use light-colored, high-albedo materials and/or an open-grid pavement with a minimum Solar Reflective Index of 0.6 over at least 30 percent of the site's hardscaped area.	5
			6.5c LH	**Reduce Heat-Island Effect: Plantings** Locate trees or other plantings to provide shading for at least 50 percent of sidewalks, patios and driveways within 50 feet of a home.	5
Yes	No	?	**Healthy Living Environment**		
			7.1 LH	**Low / No Volatile Organic Compounds (VOC) Paints and Primers** Specify that all interior paints and primers must comply with current Green Seal standards for low VOC	Mandatory
			7.2 LH	**Low / No VOC Adhesives and Sealants** Specify that all adhesives must comply with Rule 1168 of the South Coast Air Quality Management District. Caulks and sealants must comply with Regulation 8, Rule 51 of the Bay Area Air Quality Management District.	Mandatory
			7.3	**Urea Formaldehyde-free Composite Wood** Use particleboard and MDF that is certified compliant with the ANSI A208.1 and A208.2. If using nonrated composite wood, all exposed edges and sides must be sealed with low-VOC sealants.	Mandatory
			7.4 LH	**Green Label Certified Floor Coverings** Do not install carpets in below grade living spaces, entryways, laundry rooms, bathrooms, kitchens or utility rooms. If using carpet, use the Carpet and Rug Institute's Green Label certified carpet, pad and carpet adhesives.	Mandatory *if providing floor coverings*
			7.5a LH	**Exhaust Fans – Bathroom** Install Energy Star-labeled bathroom fans that exhaust to the outdoors and are connected to a light switch and are equipped with a humidistat sensor or timer, *or* operate continuously.	Mandatory
			7.5b LH	**Exhaust Fans – Kitchen: New Construction & Substantial Rehabilitation** Install power vented fans or range hoods that exhaust to the exterior.	Mandatory
			7.5c	**Exhaust Fans – Kitchen: Moderate Rehabilitation** Install power vented fans or range hoods that exhaust to the exterior.	5
			7.6a LH	**Ventilation: New Construction & Substantial Rehabilitation** Install a ventilation system for the dwelling unit, providing adequate fresh air per ASHRAE 62.1-2007 for residential buildings above 3 stories or ASHRAE 62.2 for single family and low-rise multifamily dwellings.	Mandatory
			7.6b	**Ventilation: Moderate Rehabilitation** Install a ventilation system for the dwelling unit, providing adequate fresh air per ASHRAE 62.1-2007 for residential buildings above 3 stories or ASHRAE 62.2 for single family and low-rise multifamily dwellings.	10
			7.7 LH	**HVAC Sizing** Size heating and cooling equipment in accordance with the Air Conditioning Contractors of America Manual, Parts J and S, ASHRAE handbooks, or equivalent software.	Mandatory
			7.8	**Water Heaters: Mold Prevention** Use tankless hot water heaters or install conventional hot water heaters in rooms with drains or catch pans with drains piped to the exterior of the dwelling and with non-water sensitive floor coverings.	Mandatory

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Yes	No	?			
			7.9a	**Materials in Wet Areas: Surfaces** In wet areas, use materials that have smooth, durable, cleanable surfaces. Do not use mold-propagating materials such as vinyl wallpaper and unsealed grout.	Mandatory
			7.9b	**Materials in Wet Areas: Tub and Shower Enclosures** Use fiberglass or similar enclosure or, if using any form of grouted material, use backing materials such as cement board, fiber cement board or equivalent (i.e., not paper-faced).	Mandatory
			7.10a	**Basements and Concrete Slabs: Vapor Barrier** Provide vapor barrier under all slabs. For concrete floors either in basements or on-grade slab install a capillary break of 4 four inches of gravel over soil. Cover all gravel with 6 millimeter polyethylene sheeting moisture barrier with joints lapped one foot or more. On interior below grade walls, avoid using separate vapor barrier or below grade vertical insulation.	Mandatory
			7.10b LH	**Basements and Concrete Slabs – Radon:** New Construction & Substantial Rehabilitation In EPA Zone 1 and 2 areas, install passive radon-resistant features below the slab along with a vertical vent pipe with junction box available, if an active system should prove necessary. For substantial rehab, introduce radon-reduction measures if elevated levels of radon are detected.	Mandatory
			7.11	**Water Drainage** Provide drainage of water to the lowest level of concrete away from windows, walls and foundations.	Mandatory
			7.12 LH	**Garage Isolation** Provide a continuous air barrier between the conditioned (living) space and any unconditioned garage space. In single-family houses with attached garages, install a CO alarm inside the house on the wall that is attached to the garage and outside the sleeping area, and do not install air handling equipment in the garage.	Mandatory
			7.13 LH	**Clothes Dryer Exhaust** Clothes dryers must be exhausted directly to the outdoors.	Mandatory
			7.14 LH	**Integrated Pest Management** Seal all wall, floor and joint penetrations with low VOC caulking. Provide rodent-proof and corrosion-proof screens (e.g., copper or stainless steel mesh) for large openings.	Mandatory
			7.15	**Lead-Safe Work Practices: Moderate & Substantial Rehabilitation** For properties built before 1978, use lead-safe work practices during renovation, remodeling, painting and demolition.	Mandatory
			7.16	**Healthy Flooring Materials: Alternative Sources** Use non-vinyl, non-carpet floor coverings in all rooms.	5
			7.17	**Smoke-free Building** Enforce a "no smoking" policy in all common and individual living areas in all buildings. See full criteria for "common area" definition.	2
			7.18 LH	**Combustion Equipment (includes space & water-heating equipment)** Specify power vented or combustion sealed equipment. Install one hard-wired CO detector for each sleeping area, minimum one per floor.	Mandatory
Yes	No	?	**Operations and Maintenance**		
			8.1 LH	**Building Maintenance Manual** Provide a manual that includes the following: a routine maintenance plan; instructions for all appliances, HVAC operation, water-system turnoffs, lighting equipment, paving materials and landscaping, pest control and other systems that are part of each occupancy unit; an occupancy turnover plan that describes the process of educating the tenant about proper use and maintenance of all building systems.	Mandatory
			8.2 LH	**Occupant's Manual** Provide a guide for homeowners and renters that explains the intent, benefits, use and maintenance of green building features, along with the location of transit stops and other neighborhood conveniences, and encourages additional green activities such as recycling, gardening and use of healthy cleaning materials, alternate measures for pest control, and purchase of green power.	Mandatory
			8.3 LH	**Homeowner and New Resident Orientation** Provide a walk-through and orientation to the homeowner or new resident using the Occupant Manual from 8-2 above that reviews the building's green features, operations and maintenance along with neighborhood conveniences.	Mandatory

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Appendix 2: LEED Silver References

LEED Guidelines for multi-family new construction and multi-family major renovation projects can be found at:
http://www.usgbc.org/ShowFile.aspx?DocumentID=1095

LEED for Homes Guidelines for newly constructed houses can be found at:
http://www.usgbc.org/DisplayPage.aspx?CMSPageID=147

Note: Some readers may find LEED-ND appropriate for their projects. LEDD-ND provides guidance for large scale development projects that will have an impact at a neighborhood level. It's standards do not apply to a single structure. Information and Criteria for LEED-ND can be found at:
http://www.usgbc.org/DisplayPage.aspx?CMSPageID=148

Appendix 3: NAHB Model Green Home Building Guidelines References and Checklist

The complete NAHB Model Green Home Building Guidelines as published in 2005 can be accessed through the following:
http://www.nahbgreen.org/content/pdf/nahb_guidelines.pdf

Take a look at what is coming! The more comprehensive NAHB Green Building Standard is currently under review. The guidelines for restoration and the new 'platinum' standard can be reviewed here:
http://www.nahbrc.org/technical/standards/gbseconddraft.aspx

The NAHB Pocket Checklist Begins on the next page.

Section		Bronze	Silver	Gold
1	Lot Design, Preparation, and Development	8	10	12
2	Resource Efficiency	44	60	77
3	Energy Efficiency	37	62	100
4	Water Efficiency	6	13	19
5	Indoor Environmental Quality	32	54	72
6	Operation, Maintenance, and Homeowner Education	7	7	9
7	Global Impact	3	5	6
	Additional points from sections of your choice	100	100	100
	TOTALS	**237**	**311**	**395**

Section 1: Lot Design, Preparation, and Development

1.1 Select the site to minimize environmental impact.

	YOUR SCORE	AVAILABLE POINTS	
1.1.1	___	7	Avoid environmentally sensitive areas identified through site footprinting process
1.1.2	___	9	Choose an infill site
1.1.3	___	7	Choose a greyfield site
1.1.4	___	7	Choose an EPA-recognized brownfield site

1.2 Identify goals with your team.

	YOUR SCORE	AVAILABLE POINTS	
1.2.1	___	6	Establish a knowledgeable team by identifying team member roles and writing a mission statement that includes project goals and objectives

1.3 Design the site to minimize environmental impact and protect, restore, and enhance the natural features and environmental qualities of the site

	YOUR SCORE	AVAILABLE POINTS	
1.3.1	___	6	Conserve natural resources
1.3.2	___	6	Site the home and other built features to optimize solar resource
1.3.3	___	5	Minimize slope disturbance
1.3.4	___	6	Minimize soil disturbance and erosion
1.3.5	___	8	Manage storm water using low impact development
1.3.6	___	8	Devise landscape plans to limit water and energy demand
1.3.7	___	5	Maintain wildlife habitat

1.4 Develop the site to minimize environmental intrusion during onsite construction

1.4.1	___	5	Provide onsite supervision and coordination during clearing, grading, trenching, paving, to ensure targeted green development practices are implemented
1.4.2	___	5	Conserve existing onsite vegetation
1.4.3	___	6	Minimize onsite soil disturbance and erosion

Section Total _____

Section 2: Resource Efficiency

2.1 Reduce the quantity of materials used and waste generated

	YOUR SCORE	AVAILABLE POINTS	
2.1.1	___	1-9	Create an efficient floor plan that maintain home's functionality
2.1.2	___	4-8	Employ advanced framing techniques
2.1.3	___	6	Use building layouts that maximize resources and minimize material cuts
2.1.4	___	7	Create a detailed framing plan and material takeoffs
2.1.5	___	4	Use materials requiring no additional finish resources to complete application onsite
2.1.6			Use pre-cut or pre-assembled building systems or methods as outlined below:
A.	___	3-9	Provide pre-cut joist or pre-manufactured floor truss
B.	___	6	Provide panelized wall framing system
C.	___	6	Provide panelized roof framing system
D.	___	7	Provide modular construction for entire house
2.1.7	___	4	Use a frost-protected shallow foundation

2.2 Enhance durability and reduce maintenance

	YOUR SCORE	AVAILABLE POINTS	
2.2.1	___	6	Provide covered entry (awning, covered porch) at exterior doors
2.2.2	___	7	Use recommended-sized roof overhangs for the climate
2.2.3	___	7	Install perimeter drain for all basement footings sloped to discharge to daylight, sump pit
2.2.4	___	6	Install drip edge at eave and gable roof edges
2.2.5	___	6	Install gutter and downspout system to divert water 5 feet away from foundation
2.2.6	___	7	Divert surface water from all sides of building
2.2.7	___	7	Install continuous and physical foundation termite barrier where necessary
2.2.8	___	7	Use termite-resistant materials for walls, floor joists, trusses, exterior decks, etc.
2.2.9	___	8	Provide a water-resistant barrier behind the exterior veneer or siding
2.2.10	___	5	Install ice flashing at roof edge
2.2.11	___	7	Install enhanced foundation waterproofing
2.2.12	___	9	Employ and show on plans all flashing details

2.3 Reuse materials

	YOUR SCORE	AVAILABLE POINTS	
2.3.1	___	6	Disassemble existing buildings instead of demolishing
2.3.2	___	5	Reuse salvaged materials
2.3.3	___	6	Provide onsite bins or space to sort, store scrap materials

2.4 Recycled content materials

	YOUR SCORE	AVAILABLE POINTS	
2.4.1	___	3-6	Use recycled-content building materials. List components used

2.5 Recycle waste materials during construction

	YOUR SCORE	AVAILABLE POINTS	
2.5.1	___	7	Develop and implement a construction and demolition waste management plan
2.5.2	___	5	Conduct onsite recycling efforts
2.5.3	___	6-12	Recycle construction waste offsite

2.6 Use renewable materials

	YOUR SCORE	AVAILABLE POINTS	
2.6.1	___	3-5	Use materials manufactured from renewable resources
2.6.2	___	4/per	Use certified wood and use wood-based materials from certified sources

2.7 Use resource-efficient materials

	YOUR SCORE	AVAILABLE POINTS	
2.7.1	___	3	Use products that are composed of fewer resources

Section Total _____

Section 3: Energy Efficiency

3.1 Minimum Energy Efficiency Requirements

	YOUR SCORE	AVAILABLE POINTS	
3.1.1	Mandatory		Home is equivalent to the IECC 2003 or local energy code, whichever is more stringent
3.1.2	Mandatory		Size space heating and cooling system and equipment according to building heating and cooling loads calculated using ANSI/ACCA Manual J 8th edition or equivalent
3.1.3	Mandatory		Conduct third party plan review to verify design/compliance with Energy Efficiency section

3.2 Performance Path

	YOUR SCORE	AVAILABLE POINTS	
3.2.1 Home is X% above IECC 2003			
A.	___	37	15% (Bronze)
B.	___	62	30% (Silver)
C.	___	100	40% (Gold)

3.3 Prescriptive Path

An energy-efficiency practice identified with a "(PP)" in Section 3.3 is a Performance Path practice likely to be used to calculate X% above ICC IECC in Section 3.2. If Section 3.3 is used to obtain points in addition to points from 3.2, those practices from Section 3.3 used to comply with Section 3.2 shall not be awarded any additional points.

3.3.1 Building Envelope

Increase effective R-value of building envelope using advanced framing techniques, continuous insulation, and/or integrated structural insulating system. Measures may include but are not limited to:

	YOUR SCORE	AVAILABLE POINTS	
A. (PP)	___	8	SIPS
	___	8	ICFS
	___	6	Advanced framing or insulated corners, intersections and headers
	___	2	Raised heel trusses
	___	4	Continuous insulation on exterior wall
	___	4	Continuous insulation on cathedral ceiling
B. (PP)	___	10	Air sealing package is implemented to reduce infiltration
C. (PP)	___	8	ENERGY STAR®-rated windows appropriate for local climate
3.3.2 HVAC design, equipment, and installation			
A.	___	8	Size, design, and install duct system using ANSI/ACCA Manual D® or equivalent
B.	___	8	Design radiant/hydronic space heating systems using industry-approved guidelines
C.	___	8	Use ANSI/ACCA Manual S® or equivalent to select heating and cooling equipment
D.	___	8	Verify performance of the heating and cooling system
E.	___	6	Use HVAC installer or technician certified by national or regionally recognized program
F. (PP) Fuel-fired space heating equipment efficiency (AFUE)			
	___	4	Gas furnace greater than or equal to 81%
	___	6	Gas furnace greater than or equal to 88% (ENERGY STAR)
	___	8	Gas furnace greater than or equal to 94%
	___	2	Oil furnace greater than or equal to 83%
	___	2	Gas or oil boiler greater than or equal to 85% (ENERGY STAR)
	___	6	Gas or oil boiler greater than or equal to 90%
G. (PP) Heat pump efficiency (cooling mode)			
	___	6	SEER 13-14
	___	6	SEER 15-18
	___	7	SEER 19+
	___	9	Staged air conditioning equipment
H. (PP) Heat pump efficiency (heating mode)			
	___	6	7.2 - 7.9 HSPF
	___	7	8.0 - 8.9 HSPF
	___	9	9.0 - 10.5 HSPF
	___	10	> 10.5 HSPF
I. (PP)	Ground source heat pump installed by a certified geothermal service contractor (cooling mode)		
	___	5	EER = 13-14
	___	6	EER = 15-18
	___	8	EER = 19-24
	___	10	EER = >25
J. (PP)	Ground source heat pump installed by a certified geothermal service contractor (heating mode)		
	___	6	COP 2.4 - 2.6
	___	8	COP 2.7 - 2.9
	___	10	COP = 3.0
K.	___	6	Seal ducts, plenums, equipment to reduce leakage. Use UL 181 foil tapes and/or mastic.

L.	___	8	When installing ductwork: 1. Do not use building cavities used as ductwork, e.g., panning joist or stud cavities 2. Install all heating and cooling ducts and mechanical equipment within conditioned envelope 3. Do not install ductwork in exterior walls
M.	___	6	Install return ducts/transfer grilles in rooms with doors (except baths, kitchen, closets, laundry)
N.	___	1/per	Install ENERGY STAR-rated ceiling fans
O.	___	4	Install whole-house fan with insulated louvers
P.	___	8	Install ENERGY STAR-labeled mechanical exhaust for every bathroom ducted to outside

3.3.3 Water heating design, equipment, and installation

A. ___ 4 Water heater Energy Factor equal to or greater than those listed

Natural Gas:

Size (gallons)	Energy Factor
30	0.64
40	0.62
50	0.60
65	0.58
75	0.56

Electric:

Size (gallons)	Energy Factor
30	0.95
40	0.94
50	0.92
65	0.90
80	0.88
100	0.86

B.	___	4	Install whole house instantaneous (tankless) water heater
C.	___	4	Insulate all hot water lines with a minimum of 1" insulation
D.	___	3	Install heat trap on cold and hot water lines to and from the water heater
E.	___	5	Install manifold plumbing system (parallel piping configuration, stacking plumbing)

3.3.4 Lighting and appliances

A.	___	7	Use an ENERGY STAR Advanced Lighting Package
B.	___	7	Install all recessed fixtures within the conditioned envelope
C.	___	7	Install motion sensors on outdoor lighting
D.	___	2	Install tubular skylights in rooms without windows.

E. Install ENERGY STAR-labeled appliance:

___	3	Refrigerator
___	3	Dishwasher
___	5	Washing machine

3.3.5 Renewable energy/solar heating and cooling

3.3.5.1 Solar space heating and cooling

A.	___	10	Use sun-tempered design: building orientation, sizing of glazing, design of overhangs to provide shading
B.	___	10	Use passive solar design: sun-tempered design as above plus additional southfacing glazing, appropriately designed thermal mass to prevent overheating
C.	___	8	Use passive cooling, including. shading, overhangs, window cross ventilation

3.3.5.2 Solar water heating
A. Install SRCC-rated solar water heating system
___ 8 Solar fraction: 0.3
___ 10 Solar fraction: 0.5
3.3.5.3 Additional renewable energy options
A. Supply electricity needs by onsite renewable energy source whereby the system is estimated to produces the following kWh per year:
___ 8 2,000 – 3,999
___ 10 4,000 – 5,999
___ 12 6,000 +
B. Provide clear and unshaded roof area (+/- 30 degrees of south or flat) for future solar collector or photovoltaics. Provide rough-in piping from the roof to the utility area
___ 3 Conduit
___ 5 Insulated piping
3.3.6 Verification
3.3.6.1 ___ 8 Conduct onsite third-party inspection to verify installation of energy-related features
3.3.6.2 ___ 8/per Conduct third-party testing to verify performance: blower door, duct leakage, flow rates

Section Total _____

Section 4: Water Efficiency

4.1 Water Use

	YOUR SCORE	AVAILABLE POINTS	
4.1.1	___	6/per	Hot water delivery to remote locations aided by installation of: A. On-demand water heater at point of use served by cold water only B. Control-activated recirculation system
4.1.2	___	9	Water heater located within 30 feet pipe run of all bathrooms and kitchen
4.1.3	___	7/per	ENERGY STAR water-conserving dishwasher, washing machine, etc. (7 points per appliance)
4.1.4	___	2/per	Water-efficient showerhead using aerator/venturi with flow rate < 2.5 gpm
4.1.5	___	2/per	Water-efficient sink faucets/aerators < 2.2 gpm
4.1.6	___	4-6	Ultra low flow (< 1.6 gpm/flush) toilets: (power-assist: 4 pts; dual flush: 6 pts)
4.1.7	___	7	Low-volume, non-spray irrigation system installed such as drip irrigation, bubblers
4.1.8	___	6	Irrigation system zoned separately for turf and bedding areas
4.1.9	___	7	Weather-based irrigation controllers such as computer-based weather record
4.1.10	___	9	Collect and use rainwater, as permitted by local code
4.1.11	___	7	Innovative wastewater technology as permitted by local code

Section Total _____

Section 5: Indoor Environmental Quality

5.1 Minimize potential sources of pollutants

	YOUR SCORE	AVAILABLE POINTS	
5.1.1	___	8	For vented space heating and water heating equipment: A. Install direct vent equipment B. Install induced/mechanical draft combustion equipment
5.1.2	___	6	Install space heating and water heating equipment in isolated mechanical room or closet with an outdoor source of combustion and ventilation air
5.1.3	___	6	Install direct-vent, sealed-combustion gas fireplace, sealed wood fireplace, or sealed woodstove or install no fireplace or woodstove
5.1.4	___	9	Ensure a tightly-sealed door between the garage and living area and provide continuous air barrier between garage and living areas including air sealing penetrations
5.1.5	___	6	Ensure particleboard, medium density fiberboard (MDF) and hardwood plywood substrates are certified to low formaldehyde emission standards
5.1.6	___	6	Install carpet, carpet pad, and floor covering adhesives that hold "Green Label" from Carpet and Rug Institute's indoor air quality testing program or equivalent
5.1.7	___	5	Mask HVAC outlets during construction and vacuum all ducts, boots, and grills
5.1.8	___	3	Use low-VOC emitting wallpaper

5.2 Manage potential pollutants generated in the home

	YOUR SCORE	AVAILABLE POINTS	
5.1.2	___	7	Vent kitchen range exhaust to the outside
5.2.2			Provide mechanical ventilation at a rate of 7.5 cfm per bedroom + 7.5 cfm and controlled automatically or continuous with manual override. Choose:
A.	___	7	Exhaust or supply fan(s)
B.	___	9	Balanced exhaust and supply fans
C.	___	10	Heat-recovery ventilator
D.	___	10	Energy-recovery ventilator
5.2.3	___	3	Install MERV 9 filters on central air or ventilation systems
5.2.4	___	4	Install humidistat to control whole-house humidification system
5.2.5	___	6	Install sub-slab de-pressurization system to facilitate future radon mitigation system
5.2.6	___	9	Verify all exhaust flows meet design specifications

5.3 Manage moisture (vapor, rainwater, plumbing, HVAC)

	YOUR SCORE	AVAILABLE POINTS	
5.3.1	___	6	Control bathroom exhaust fan with a timer or humidistat
5.3.2	___	6	Install moisture-resistant backerboard under tiled surfaces in wet areas
5.3.3	___	9	Install vapor retarder directly under slab (6-mil) or on crawl space floor (8-mil)

5.3.4	___	6	Protect unused moisture-sensitive materials by just-in-time delivery, storing in dry area, or tenting and storing on raised platform
5.3.5	___	5	Keep plumbing supply lines out of exterior walls
5.3.6	___	4	Insulate cold water pipes in unconditioned spaces
5.3.7	___	4	Insulate HVAC ducts, plenums, and trunks in unconditioned basements and crawl spaces
5.3.8	___	4	Check moisture content of wood before it is enclosed on both sides

Section Total _____

Section 6: Operation, Maintenance, and Homeowner Education

6.1 ___ 9 Provide Home Manual to owners/occupants on the use and care of the home, including:

A. Narrative detailing importance of maintenance and operation to keep a green-built home green
B. Local Green Building Program certificate
C. Warranty, operation, and maintenance instructions for equipment and appliances
D. Household recycling opportunities
E. Information on how to enroll in program where home receives energy from renewable energy provider
F. Explanation of the benefits of using compact fluorescent light bulbs in high-usage areas
G. A list of actions to optimize water and energy use
H. Local public transportation options (if applicable)
I. Clearly labeled diagram showing safety valves and controls for major house systems

6.2 ___ 2 Optional information to include in the Home Manual (see User Guide)

6.3 ___ 7 Provide education to owners/occupants in the use and care of their dwellings: Instruct homeowner/occupants about the building's goals and strategies and occupant's impact on costs of operating the building. Provide training to owners/occupants for all control systems in the house.

6.4 ___ 1 Solid waste: Encourage homeowners/occupants to recycle by providing built-in space in the home's design (kitchen, garage, covered outdoor space) for recycling containers

Section Total _____

Section 7: Global Impact

7.1 Products

	YOUR SCORE	AVAILABLE POINTS	
7.1.1	___	3	Note product manufacturer's operations and practices (environmental management system)
7.1.2	___	6	Choose low- or no-VOC indoor paints
7.1.3	___	5	Use low-VOC sealants

7.2 Innovative options

	YOUR SCORE	AVAILABLE POINTS	
7.2.1	___	4	Demonstrate that builder's operations and business practices include environmental management concepts